



ESCUELA TÉCNICA SUPERIOR DE INGENIEROS INDUSTRIALES Y DE TELECOMUNICACIÓN

Titulación :

INGENIERO TÉCNICO DE TELECOMUNICACIÓN,
ESPECIALIDAD EN SONIDO E IMAGEN

Título del proyecto:

VIDEO REALIZATION WITH 3D ANIMATIONS

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Yamaguchi, August 1st, 2012

Contents

1	Introduction	1
1.1	Goal of this Project	1
1.2	Materials	2
1.3	Structure of the work	3
2	Development of the work	5
2.1	Pre-production stage	5
2.2	Production stage	6
2.3	Post-production stage	6
2.3.1	Making textures of the 3D animation	6
2.3.2	Audio mixing	9
2.3.3	Special effects and 3D animation	10
2.3.4	Video editing	14
3	Conclusions	16

Introduction

1.1 Goal of this project

The project consists in the realization of a video which shows the most representative places of Yamaguchi city, in Japan, and Yamaguchi Prefectural University.

Yamaguchi is the capital of Yamaguchi Prefecture, located at the western part of Japan's main island. The city has an estimated population of 198,971 and a population density of 194.44 persons per km². The total area of the city is 1023.31 km².

The main landmarks of Yamaguchi are a famous Buddhist temple, Rurikō-ji, with a five-story pagoda, and a Catholic cathedral that commemorates the visit of Saint Francis Xavier and the subsequent introduction of Christianity to Japan in 1550.

Yamaguchi city and Pamplona city, provincial capital of Navarra, in Spain, keep a union as sister cities since 1980. Their bond is based on Saint Francis Xavier, born in Navarra and patron saint of the province.

Yamaguchi Prefectural University (YPU) is a public university located in Yamaguchi city. It has three faculties, five departments and two postgraduate courses.

Approximately 1,300 students attend YPU, 30 of them are exchange students who come every year from Finland, America, Canada, Spain, China and Korea.

This video aims to give an overview of Yamaguchi city, showing its landmarks and the traditions that characterize the spirit of the city. Exchange students coming for the first time to Yamaguchi will be the main target audience for this video, which has the purpose of giving a general idea of the city to newcomers. However, the video could also be shown in occidental universities so as to bring this Japanese city closer to foreign students and arouse their curiosity for Japanese culture.

The video lasts 3 minutes and 51 seconds, and it can be used by the Yamaguchi Prefectural University so as other students can watch it. Additionally, it can be uploaded on the University international website to be accessible worldwide.

1.2 Materials

Below, we describe the materials we have used for the realization of the video.

In the Production stage we have used the following materials:

- Camera SONY HDR-HC7



Figure 1. Camera SONY HDR-HC7

- Tripod ATV-491



Figure 2. Tripod ATV-491

- 2 SONY 60 minutes Mini Digital Video Cassette

In the Post-production stage we have used the following materials and software:

- Computer HP Pavilion dm4
- IL4615 i.LINK cable
- Program for making the 3D animation textures: *Adobe Photoshop CS6 Extended*
- Program for mixing the audio tracks: *Adobe Audition CS6*
- Program for the inclusion of special effects and 3D animations: *Adobe After Effects CS6*
- Program for video editing: *Adobe Premiere Pro CS5.5*

1.3 Structure of the work

This project has been carried out in three different stages:

a) Pre-production stage:

Video design

Firstly, we must think about the approach we want to use in the video, the way we want to transmit this approach and the kind of video it is going to be. In this case, it will be a documentary video about the city of Yamaguchi.

Documentation process

Once we know what type of video we are going to create, the next step is to decide which locations are to be shown in the video. To accomplish this task, we need to carry out a documentation process, in order to learn which are the most tourist and historical places of the city.

Scene selection: places, times and shot angles

In order to be more efficient at the Production stage, we must visit all the selected places of the city during the documentation process and decide the best shots, the perfect time and place in which we will film the scenes.

Audio selection

Also, we have to choose the different audio tracks we want for each part of the video, in order to give the viewer the feeling of a different atmosphere in each part.

Equipment and Software tools familiarization

Finally, we have to familiarize ourselves with the camera and learn how to manage the software programs (Adobe Photoshop, Adobe After Effects, Adobe Premiere Pro, Adobe Audition) for video editing and the creation of 3D animations.

b) Production stage:

The next task is to record all the scenes of our video, repeated as necessary until achieving the expected results.

The materials for recording (both camera and tripod, Figure 1 and Figure 2 respectively) were borrowed from the Yamaguchi Prefectural University during this stage. The university allowed us to make use of them for three working days, which were exploited to their fullest to reach our goal.

c) Post-production stage:

The post-production stage is the most complex and technical part of this project.

Creation of 3D animation objects and textures

First of all, we create the 3D animation object we have thought about during the pre-production stage for the introduction part of the video, and the textures of the 3D animation with the program *Adobe Photoshop*.

Audio mixing

Secondly, with the chosen audio tracks and with the program *Adobe Audition* we proceed to mix the different audio tracks into a single and final one, with a total length matching the length of the video and with audio variations in synchrony with the transitions between scenes.

Special effects and 3D animations

Then, with the program *Adobe After Effects* we create the 3D animations with the special effects required as we have planned it in the pre-production stage, taking care of keeping everything synchronized with the music.

Scenes cutting and editing – Final video editing

Last but not least, with all the video recorded data transferred to the computer and with the program *Adobe Premiere Pro*, we cut the scenes we are interested to include in our video, and synchronizing these with the music, we put them together and add video transitions effects where needed, to soften the scene changes.

Development of the work

2.1 Pre-production stage

This phase is the process of preparing all the elements involved in the film. It consists in finalizing preparations for production go into effect.

During pre-production, the script is broken down into individual scenes and all the locations, special effects and visual effects are identified. A detailed schedule is produced and arrangements are made for the necessary elements to be available to us at the appropriate times.

The video starts and finishes with a 3D animation.

- | | |
|----------------|--|
| First scene: | An old book appears, and everything is in black and white. |
| Second scene: | A flash of light appears and enters the book, making the black and white scene turn into a color scene. |
| Third scene: | Gradually the book becomes closer, until we see handwritten in the cover the title: “Yamaguchi”. |
| Fourth scene: | The book opens and in the first page we can see a map of the world in which a path is traced from Pamplona (Spain) to Yamaguchi (Japan). |
| Fifth scene: | The book does a page turn and in the next page it is shown a box with the video. We zoom in the box and the video starts in full screen. |
| Sixth scene: | The created video is played in full screen, and when it is finished we come back to the scenery with the book. |
| Seventh scene: | The book is closed and we gradually zoom out from it until it disappears. |

The video inside the 3D animation is a documentary film about the city of Yamaguchi which shows the most representative places of this city (Figure 3), which are: The Ruriko-ji Temple, Seshu-tei garden, Saint Francis Xavier Church, Yamaguchi station, Yuda onsen, commercial galleries, Yamaguchi Centre for Arts and Media, Ichinosakagawa river and Yamaguchi Prefectural University.



Figure 3. Images of the most representative places in Yamaguchi city, shown in the video

After documenting ourselves on which are the most interesting and famous places in Yamaguchi city, we select the most relevant spots that are to appear in the video and, visit them, in order to decide the best shots, the perfect time and place in which we will film.

Also, we have to choose the different audio tracks we want for each part of the video, thinking about the feeling we want to transmit to the viewer.

Likewise, an important issue is to familiarize ourselves with the camera, and learn how to manage the software programs for video editing and the creation of 3D animations.

2.2 Production stage

This is the shortest stage of the three, due to the reduced available time with the recording materials (See Section 1.3 for details). In this stage, the video film is created and shot with the help of the camera and tripod specified in Section 1.2.

The action is shot in as many takes as necessary until achieving the expected results.

We must take into account the different settings of the camera parameters for each different type of scene. We have recorded the different scenes in High Definition in order to obtain the best image quality, which correspond to a resolution of 1920x1080. The signal is interlaced, which means that the images are displayed in two fields: first the odd rows and then the even rows, each field with 540 rows.

We have employed two video cassettes whilst recording all the different scenes of our video, each one with a duration of 60 minutes.

2.3 Post-production stage

2.3.1 Making textures of the 3D animation

The main and first thing that we create with the program *Adobe Photoshop* is the 3D object that we have conceived: an old opened book, which we need for the 3D animation. In order to create it, we follow the steps outlined below:

1. We create a new document of 1280x720 pixels with a resolution of 72 points-per-pixel.
2. In a new layer and with the pen tool, we start to do the layout of the covers of the book.
3. With the bucket tool, we color the left book cover with a dark brown color.
4. We change the layer style so as to get a more realistic cover. We vary the parameters of Bevel and Emboss, Stroke, Satin and Gradient Overlay.
5. In a new layer and with the pen tool, we create a small rectangle situated at the bottom of the book, between the two covers.

6. With the bucket tool, we fill this rectangle with the same brown as the book cover and copy and paste the cover layer style to this new layer of the rectangle.
7. We create a new document of 200x200 pixels with a red tone.
8. In this new document, we add a Halftone Model, inside Sketch, inside Filter, with the Motive of line. This way, we obtain a square with red and white lines.
9. We rotate the square by approximately 75 degrees and add noise.
10. With the selection framework tool, we make a selection of a flat rectangle and move this selection to the first document where we have the book, precisely just above the last brown rectangle created.
11. We adjust the size as to fit with the first rectangle and change the layer style, varying the parameters of Bevel and Emboss. Thereby, we will have created the rope of our book.
12. We join these two layers with both rectangles into one unique layer and deform it with a dome shape.
13. In a new layer and with the pen tool, we draw a rectangle located along the whole book, between both covers. This layer will not be seen because the pages of the book will place over it, but it helps us as reference.
14. The color and style of this layer will be the same as the already created cover.
15. In a new layer, again with the pen tool, we draw the first page of the book, and with the bucket tool, we fill the page with a beige color.
16. We change the layer style varying the parameters of Parallel Shadow and Gradient Overlay.
17. We double the page layer, and shifting this new layer with the move tool, and resizing it we obtain the second page of the book.
18. Repeating the last step four times we get the first four pages of the book.
19. The next page of the book, we will deform it with a dome shape so as it has more curvature.
20. In the last pages of the book, the ones that are at the front, we have to use the pen tool in order to create the curvature manually. We then fill each page, with the bucket tool, with the same color as the previous pages, and we copy and paste the layer style used in the previous pages too.
21. With the underexpose tool we create some shadows under each page.
22. Once we have finished creating all the pages, we create a group with all the layers of each page and the cover, which will be the left side of our book.
23. We double this group layer in order to create the right side of our book, flipping it horizontally and shifting it until it is placed in the correct position.
24. With the underexpose and overexpose tool, we add some shadows and lights respectively to the last pages of the book.
25. Finally, we will place in each corner of the last pages the drawing we have prepared for decorating the pages.

The result can be seen in Figure 4:

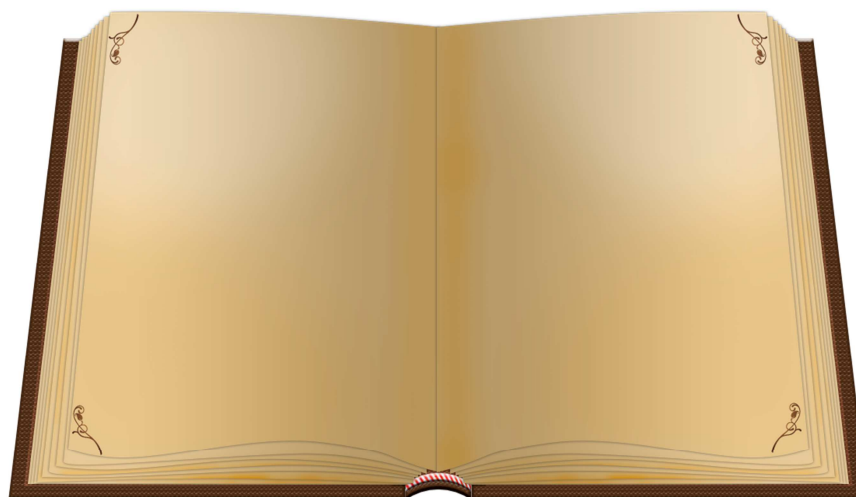


Figure 4. 3D object created with Adobe Photoshop

The next texture we need to develop for creating the 3D animation consists in the map of the world with the countries of Pamplona and Japan highlighted in red color and with the names of these countries written in black ink. This map has to be printed in the first page of the open book.

We obtain the map from the following internet source: <http://vectormadness.com/download/old-and-classic-world-map-7915.html>, and with the program *Adobe Photoshop*, we transform it in the way we need following the next steps:

1. We create a new document of 1280x720 pixels with a resolution of 72 pixels-per-frame.
2. We insert the map of the world in this document.
3. With the pen tool, above the countries of Pamplona and Japan in the map, we draw their shapes.
4. With the bucket tool, we fill these countries with red color.
5. We write the text that must appear in the map with a font size big enough to be read by the viewers, and place it in the right position.
6. With the pen tool, in the document of the open book created before, we draw the contour of the first pages of the book and move them to a new document of 1280x720 pixels.
7. We move the already edited map to this new document, and place the map above these pages.
8. Finally, we deform each side of the map which corresponds to each side of the book independently with a dome shape so as to obtain a good effect as if the map would be glued in the book.

The result can be seen in Figure 5:



Figure 5. Texture of the map of the world glued in the first page of the book, created with Adobe Photoshop

The other textures used in the 3D animation, such as the table and the cover of the book, have been obtained from the following sources: <http://beyond-oddities.deviantart.com/art/Local-Texture-Three-by-One-77137822> and http://www.google.com/imgres?q=texture+cover+book+brown&um=1&hl=es&client=firefox-a&rls=org.mozilla:es-ES:official&tbnid=tk94yDymopBRsM:&imgrefurl=http://textures.thefree3dmodels.com/stuff/grunge/grunge_book_cover_brown_dirty/11-1-0-360&docid=yUe5pgHPgTHxHM&imgurl=http://textures.thefree3dmodels.com/sf/3/360.jpg&w=983&h=1270&ei=uLPmT6D1J4aYmQXKprT1Cg&zoom=1&iact=hc&vpx=181&vpy=139&dur=1221&hovh=255&hovw=197&tx=141&ty=124&sig=104951248302722546632&page=1&tbnh=154&tbnw=119&start=0&ndsp=22&ved=1t:429,r:0,s:0,i:71&biw=1366&bih=662 , respectively.

2.3.2 Audio mixing

Previously, in the pre-production stage, we have chosen one audio track to be played at the beginning of the video, during the flash of light that appears and enters the book, and a different audio track for the rest of the video.

But, obviously, these audio tracks do not fit perfectly with the length of our video, so, with the program *Adobe Audition*, the first task we carry out is cutting the audio track where we have the flash of light effect and keep only the seconds we are interested in.

In the second audio track that will accompany the rest of the video, we cut some pieces in the middle of the track so that it fits well with the length of our video. This is a meticulous work due to the fact that you have to cut it without the human ear noticing any abrupt change, or difference.

Finally, we have mixed the different audio tracks into a single and final one. For this, in an audio multitrack, we have introduced each part of both tracks in the order we want them to be played.

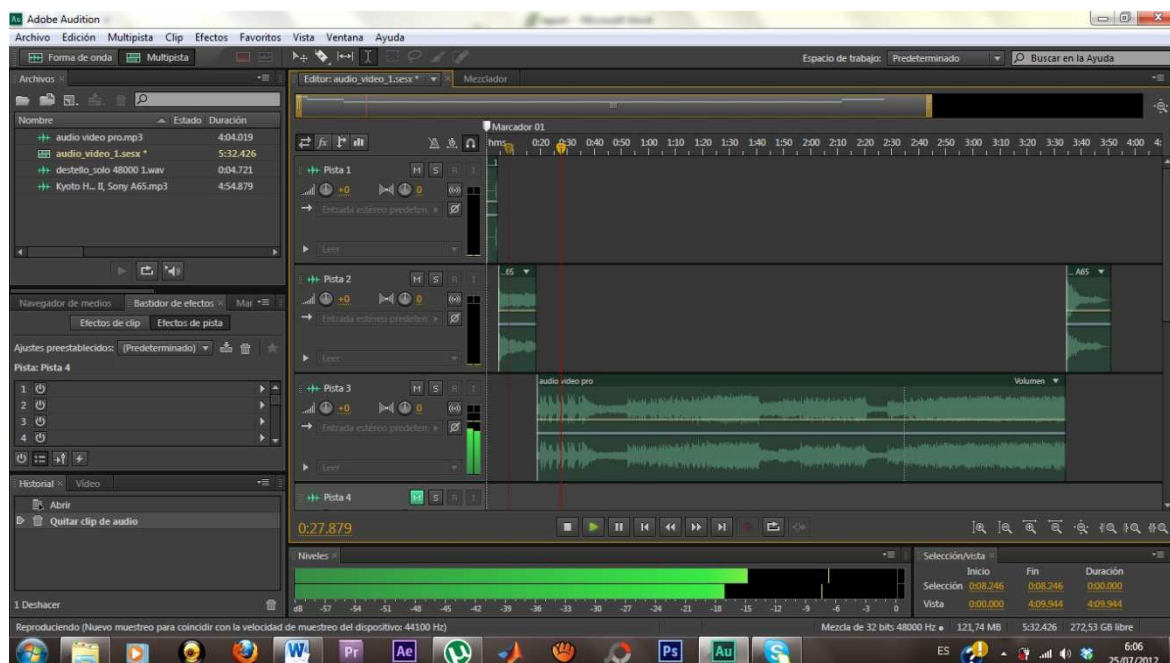


Figure 6. Screen shot of the program Adobe Audition CS6 while mixing the different audio tracks in an audio multitrack

We export this multitrack mix into a MP3 file 320 Kbps format and 48000 Hz Stereo, 32 bits sample type in order to operate with it in an easy way in the next tasks of editing the video and creating the 3D animation.

2.3.3 Special effects and 3D animation

This section is of particular relevance to the project, and the most demanding task in terms of time. In this section we have created the 3D animation with the special effects required as we have planned it, everything synchronized with the music.

For this, we have used the program *Adobe After Effects*.

Firstly, we have created a new composition of the same size as our video: 1920x1080 pixels, with a frame rate of 29,97 fps and a duration of 4 minutes.

Secondly, we have created a new Solid of black color and the same size as our composition.

In this point, we have imported the textures of the table and the cover of the book, due to the fact that these are the first elements appearing in the video.

We have adjusted the size of both textures to the composition and created the shadow of the cover of the book duplicating the layer of the cover, shifting it some pixels to the left and down regarding the cover of the book, and adding three effects, such as Levels, Gaussian Blur and Edge Position.

We have added an elliptical mask to the layer of the table in order to create the effect of focusing on the book and added two key frames in the Expansion of the

mask parameter, so as change its value when the flash of light enters the book and we can see clearly all the scene with the book and the table.

At the beginning of the video we switch from a black background to the first scene with the book and the table. We achieve this effect by adding two key frames in the Opacity parameter of each layer in the composition, and changing its value from 0% in the first key frame to 100% in the second one.

To accomplish the movement of the camera along the entire video, we have created a new Null object and a new Camera, parenting the Camera with the Null object, adding different key frames where we desire a change in the Position, Orientation and Rotation parameters in the layer of the Null object; activating the 3D layer in the Null object layer and in each layer we want to integrate into the movement and positioning these layers below the Camera and Null object layers, with all of this steps, we achieve the desired movement.

The video starts with the entire scene in black and white. To this end, we have created a new Adjustment layer in which we have added the Black and White effect and we only have inserted two key frames in the Opacity parameter of this layer: the first one with a value of 100% and the second one, in the instant we want that the scene turns into a color scene, with a value of 0%.

In order to produce the flash of light which enters the book we must create a new Solid, with the 3D layer activated, and add on it the CC Particle Systems II effect. Adding various key frames in the Position parameter of this effect, we can make that the flash traverses the path how it does, and adding two key frames in the Opacity parameter of the Solid layer we can make it disappear, with the value 100% in the first one and 0% in the second. The particle type chosen for this flash is “star”.

We have created a new Solid with red tone and the 3D layer activated in order to set up the waves that appear in the video when the flash of light enters the book. For this, we have added four elliptical masks, a pair for each wave. We have changed the Opacity value to 22% instead of 100% so as to obtain a subtle effect, since a 100% Opacity would be excessive. As the waves come from the center of the book and gradually expand themselves, we have added two key frames in the Mask layout parameter of each mask. In the first key frame we have the masks situated closer to the center of the book and in the second key frame we have located the masks where we want the waves to end.

The next task is to create the handwritten text “Yamaguchi”. We have created a new composition of the same size and length as the main composition. We have created a new Text layer where we type the text “Yamaguchi” and we have chosen the font, size and color that we want. We have duplicated twice the Text layer so as to have three identical layers, and we have added some effects to let the text look more like ink. In the top Text layer we have added the Tint, Matte choker and Roughen edges effects and we have varied their parameters until achieve the desired results. To the second Text layer we have added the Matte choker effect. And to the bottom Text layer we have added the Matte choker and Roughen edges effects. Once we have added all the effects, we have changed the blend mode of the top and middle Text layer to Color Burn.

Once the appearance of the text has been set up, we have copied this composition and pasted it into the main composition, activated its 3D layer and placed it below the layer of the Camera and the Null object. Inside the Text layer in

the main composition, we have added the Stroke effect and, with the Pen tool, we have started drawing the masks to reveal the text with later on, letter by letter, in the same order that we would have written it by hand. It is important to select in the Style of painting parameter: Reveal the original image, and also activate the option: All masks. Adding two key frames in the End parameter, the first one with the value 0% and second one with the value 100% in the instant where you want the text to be written completely, we accomplish this handwritten effect.



Figure 7. Screen shot of the program Adobe After Effects CS6 while setting the different key frames in the text layer: "Yamaguchi"

The next step is to elaborate the effect of the book opening. To this end, we have added two key frames in the Orientation parameter inside the layers of the text and the cover of the book. Specifically, we have changed the value of the axis Y with same variation in degrees from the first key frame until the second one, in both layers.

Once the book is opened, we can see the open book we have previously created in *Adobe Photoshop*.

We have created a new composition, of the same size and length as the main composition, in order to elaborate the next effects involved in the open book in this composition.

We have imported the files of the first page with the map glued on it (Figure 5), the first page without any map (which will correspond to the second page of the book) and the open book (Figure 4), and inserted these three files (in the order listed) and the texture of the table in the new composition.

Our next aim is to create the path that it is traced in the map from Pamplona (Spain) to Yamaguchi (Japan). For this we will create a new Shape layer, in which we will set the Fill to "none", the Stroke to "solid color", the Stroke Color to red and the Stroke Size to 12 pixels. With the pen tool we will select in the map the start and end points of our path, and for animating these points we will add the

effect of “Trim paths”. We will set two key frames in the End parameter inside this effect, the first one with the value of 0% in the instant we want the route to start and the second key frame with the value of 100% where we want the route to end. In this point, we have a path with the shape of a straight line, but we want to curve this shape so using the Convert Vertex tool we obtain this. Lastly, we will set the blending mode of the Shape layer to “multiply” instead of “normal” in order to darken the route color a little bit.

The next work is to animate the page turn of the book. In *Adobe After Effects* we have an effect called CC Page Turn that will ease our work. The desired effect is obtained by adding this effect to the pre-composition of the page with the map glued on it, setting the Render to “Front & Back page”, the Back Opacity to 100% and the Back Page to the page without any map; and adding two key frames in the Fold Position parameter so as to set up in which position and in which instant we want the effect of turning the page to start and finish.

At this point, we will have to copy and paste this composition into the main one, activate the 3D layer and place it, like all the other layers, below the Camera and Null object layers so that it can be guided by the movement of the Null object.

Now, we must import to the project the video file previously edited with *Adobe Premiere Pro*. As with the other layers, we have activated its 3D layer and place it below the layers of the Camera and the Null object.

We have decreased the scale of this layer, since we want it to be shown in a box inside the book, and we have added the Radial Shadow and Roughen Edges effects in order to create a kind of old frame around the video, like a picture.

It is worth emphasizing that we are able to watch the video in full screen thanks to the Camera and Null Object layers (see above for a detailed explanation on how these objects work).

Next, we have introduced a new Text layer in which we have typed the text “Raquel Vidorreta”. We have chosen the font type, color and size that we want and set four key frames in the Opacity parameter: the first couple for making the text to appear gradually from 0% to 100%, and the second couple for the opposite effect from 100% to 0%.

The next effect that we implement is the book closing. For that purpose, we have added two key frames in the Orientation and in the Position parameters inside the layers of the text “Yamaguchi” and the cover of the book. We have changed these parameters with the same variation in degrees from the first key frame until the second one, in both layers.

Finally, we see in the last two seconds of the video how all the elements displayed in the scene gradually disappear until the scene becomes completely black. We have achieved this by setting two key frames in the layers of the text “Yamaguchi”, the cover of the book, the shadow of the cover and the table; the first one set to 100% and the second key frame with a value of 0%.

Once the video animations are completed, we proceed to its exportation. We must add it to the render queue, choose the format file that we want to create which in this case will be QuickTime, and activate the audio output with 48,000 KHz, 16 bits and Stereo. Once we have selected all the parameters of the video, we proceed to render.

2.3.4 Video editing

To be able to develop this task, the first thing we must do is to transfer all the recorded data from the camera to the computer where we are going to work. For this, we use the i.LINK cable previously specified.

Since the 3D animations were planned in advance, we know where exactly we want the video to start according to the audio track. So, we proceed to cut the audio track with the program *Adobe Audition* from the instant where we want the video to start until the end.

For the video editing, we have used the software *Adobe Premiere Pro*. For getting started, we have created a new sequence with a visualization format of 25 frames per second, and a video preview with a width of 1440 pixels and a height of 1080 pixels; the editing mode is HDV 1080p.

We have imported the audio file created for this video, which will serve us as a reference for synchronizing the images with the audio; and we have also imported the two video files with all our recorded data, which correspond each one to one of the cassettes.

Firstly, we have to select the scenes that we want to be in our video. For this, we have done an entire view of the recorded data, and then, we have proceeded to mark for each scene the entry and exit points in the exact instants. For each scene, with these points marked, we will drag just the video (because we are not interested in the audio of the recorded data) to the time line of the sequence, where we will have our edited video.

Once we have all the desired scenes in the time line we have to construct the video. According to the audio track it is possible to: determine the order in which the scenes must appear, synchronize them with the music, start to place them one behind another, and also overlapping some with each other in the different video tracks.

After this task, it is time for the addition of some video transitions effects. At the beginning and end of the video, we have added the Switch to Black effect in order to start with a black screen and gradually switch to the first scene of our video, and to end with the last scene of our video that smoothly changes into a black screen.

An additional effect that we have included is the Cross Dissolution. We have set it in six different scenes of our video, enabling a gradual transition in between shots. By doing so, there is an specific instant in which we are able to see both scenes at the same time. This way, the video acquires a smart style.

With the video already prepared, we proceed to render the entire work area of the created sequence.

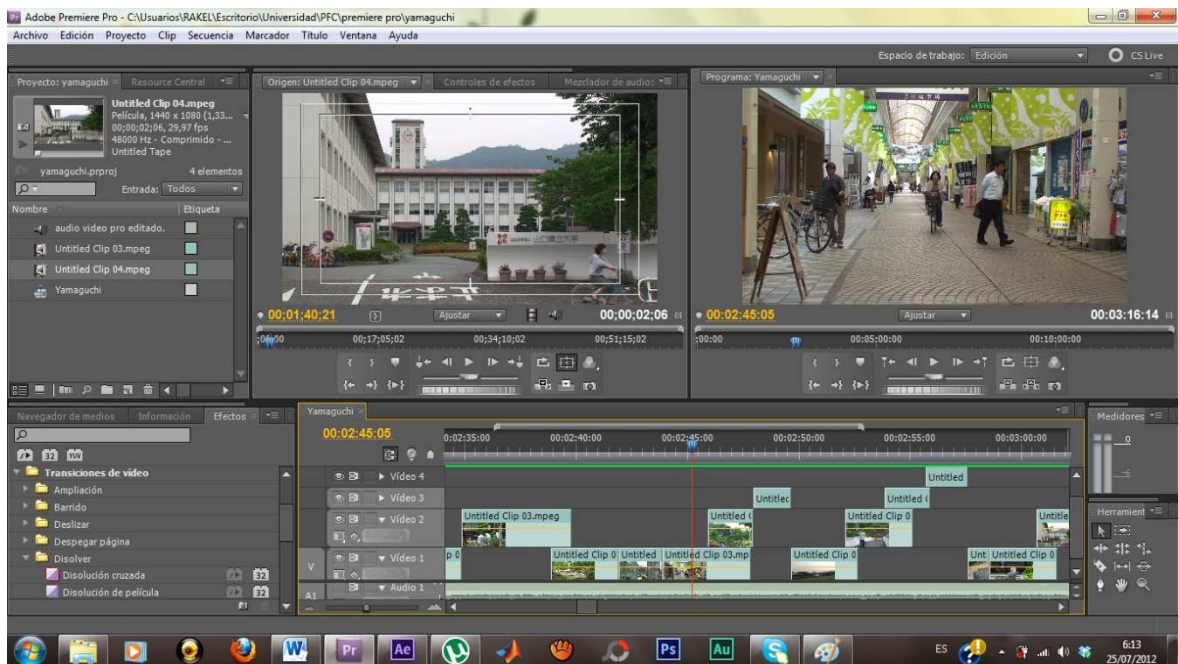


Figure 8. Screen shot of the program Adobe Premiere Pro CS5.5 while editing the different scenes of our video

At this point, the final task is to export the video. We have chosen the QuickTime format due to the fact that we will have to import it later on to our project in *Adobe After Effects*, and we know that this format is compatible with this software. We have selected the DVCPRO HD 1080p25 video codec, which means that it will have a resolution of 1440x1080 pixels, 25 frames per second and a progressive signal. We have also deselected the option of Export Audio because we have just used it as a reference and we will have the entire audio track in our project of *Adobe After Effects*.

Conclusions

1. A four-minute video of Yamaguchi city, in Japan, has been successfully created to be used as visual presentation for prospect international students coming for the first time to Yamaguchi.
2. We have learnt the basic phases necessary to create a documentary film: the Pre-production stage, Production stage and Post-production stage. In the Pre-production stage, we have carried out all the necessary arrangements and planning of the future work in the next stages, as well as a documentation process to decide the contents of our film. In the Production stage, we have fulfilled the task of recording all the scenes of our video with a SONY HDR-HC7 camera and an ATV-491 tripod. In the Post-production stage, we have edited the video, created the 3D animations, implemented the special effects and made the audio track of our video.
3. We have learnt how to employ advanced software programs designed for the creation and edition of video: *Adobe Premiere Pro CS5.5* software was employed in the editing part of the work. The use of 3D animations has been explored in order to enhance the quality of the video and they were created with *Adobe After Effects CS6* software. The final audio track has been mixed with *Adobe Audition CS6* software, and the 3D animations textures have been made with *Adobe Photoshop CS6 Extended* software.